Recreation Carrying Capacity Analysis
Twentymile River Valley

Glacier Ranger District
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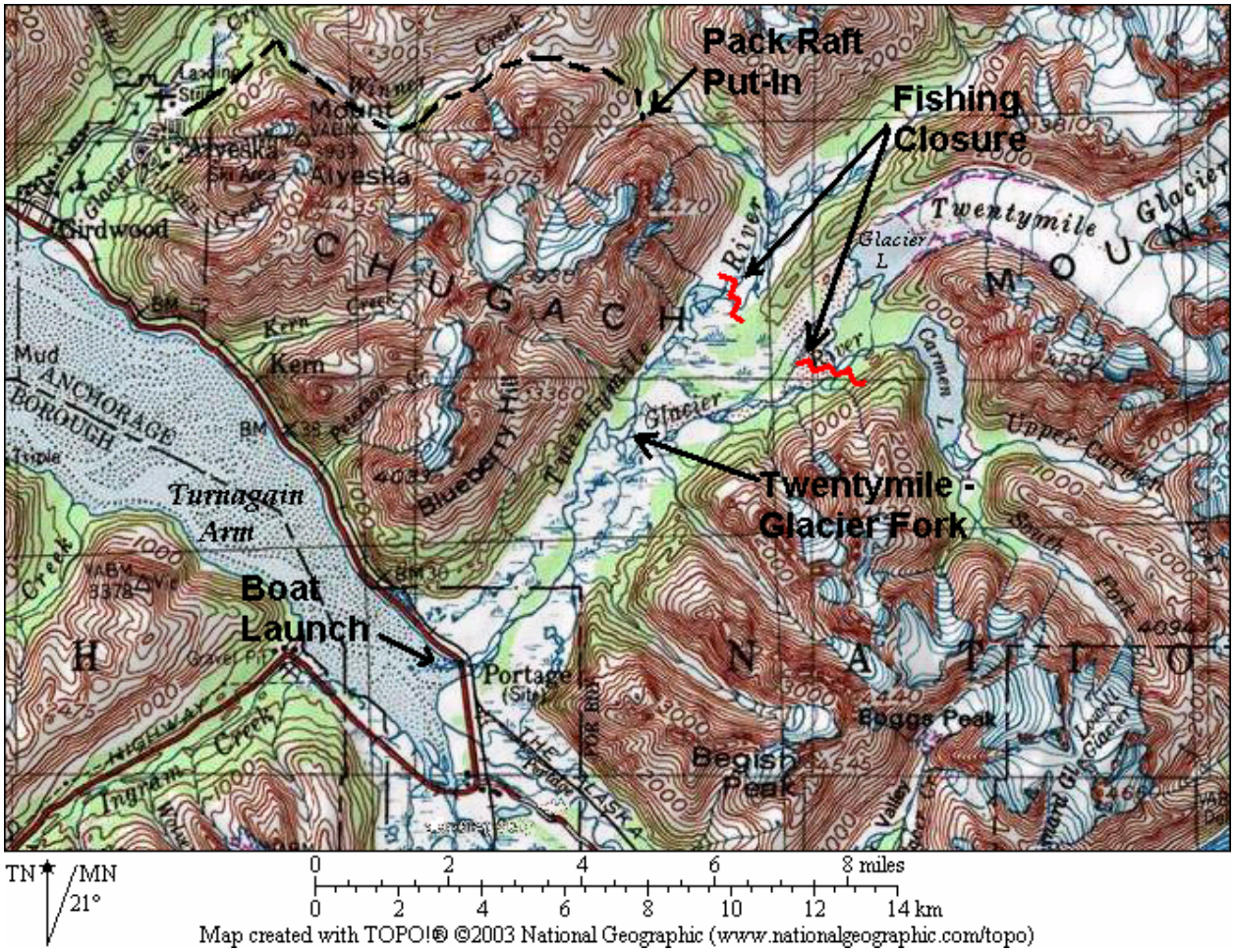
The Twentymile River Valley, located approximately 9 miles south of Girdwood Alaska, is a predominantly wildland, undeveloped valley that empties into Turnagain Arm. Surrounded by steep, forested mountain slopes rising from sea level to nearly 4,000', with glaciers capping the more distant peaks, it is a place of outstanding scenic beauty. It is well known for its summer silver salmon run, and is also fished for Dolly Varden, red, pink and chum salmon.



The majority of this river's recreational use is in summer, primarily for fishing. Growing uses include sightseeing, and pack rafting. There is limited use by nonmotorized boaters floating up with the incoming tides. The only road access to the river is at its confluence with Turnagain Arm. Float plane fly-in access is available at two lakes at the headwaters (Glacier and Carmen); hiking 10 miles in on a primitive trail from Girdwood to the upper stretches of River is also available. No trail exists along the lower river, although a trail that would bring hikers near the river about 4 miles in from Turnagain Arm has been planned. Much of the valley bottom is wetland, making foot travel in summer difficult.

There are two small cabins on the river, both under special use permit. One is within 100' of the river; the other is on a slough and is not visible from the main river channel.

Winter use depends on snow conditions, and can be significant when snowpack or ice allows. This season and use is not considered in this analysis.

Purpose of the Analysis
This analysis looks at implementing the Forest Plan to provide optimal carrying capacity for recreation use along the Twentymile River in order to make decisions concerning the amount of summer season outfitter/guide use permitted to operate on the river. The total use (guided & non-guided) needs to insure the recreation experience and natural resource values of the Twentymile River are not compromised.

A capacity study was completed in 1998, titled "Recreation Use Limits for the Twentymile River". It was done in response to an increase in demand for use of the river. Over time, changes have occurred leading the District Ranger to request a new look at the river's capacity. Changes include:

- The Forest Plan was revised in 2002.
- The revision changed the area's Recreation Opportunity Spectrum (ROS) from 3 classes (Primitive, Semi-Primitive Non-motorized, and Semi-Primitive Motorized) to one class for the entire valley (Semi-Primitive Non-Motorized). Management direction is tied to the ROS class.
- As part of the revision, the river was studied for inclusion in the Wild and Scenic River System and found to be eligible as a Scenic River; management direction is now geared towards managing the river to protect its outstandingly remarkable values. These values are "the synergistic effects of the wetland, lake and river complex within the Twentymile Valley"
- Sightseeing is emerging as a high use. In 2005, two O/G's accounted for 526 client days of sightseeing use. This is almost twice the total O/G use that occurred in 2004 (274 total client days).
- Pack rafting use is expected to grow dramatically, with the addition of a constructed trail to the headwaters of the Twentymile River.
- More non-guided use occurring.

Additionally, the 1998 study, while providing an overall use level, did not address distributing the use evenly throughout the season of use, or how people that are using the river are affecting each other's experience. An update to the methodology is needed to better reflect the recreational capacity of the river.

Existing Situation:
Currently, the Outfitter Guide capacity has been set at 600 client days. This was determined by calculating the total land area along a 150' wide river corridor, and multiplying this acreage by the moderate *Capacity Coefficient* for the ROS class. This resulted in 8 People At One Time (8 PAOT) capacity. The season of use was determined to be 150 days (May 1 – September 30). The capacity for the river was set by multiplying the season (150days) by the PAOT (8) = 1,200 total PAOT's over the season. The Forest Plan had determined that 50% of the use would be available for Outfitter/Guides (O/G), resulting in 600 client-days available for O/G use. There were no

stipulations that this use needed to be spread uniformly across the 150-day season, even though that was how the capacity was calculated.

Currently, there are six O/G's that are either under permit or requesting permits to operate on the river, four are jet-boat fishing and/or sightseeing operations, one is strictly a fly-in float trip, and one is a one-time hike-in float trip.

In 2005, 799 client days were used, with 634 (79%) in July and August. The July & August use was primarily from two O/G's. Four O/G's were under permit to operate; the fly-in/float-out guide had just 1 trip in June and 1 in July, and one O/G did not have any paying customers in 2005.

Non-guided use on the river is predominantly anglers chasing silver salmon. Other uses include:

- Nonmotorized use (paddle up river on the incoming tide, pack raft float)
- Hooligan fishery in May (boat launch area)
- Duck Hunting in September (boat launch area)
- Hunting – goats, bear, moose permit
- Special Use Cabin permittees

Non-guided use continues to increase. People have discovered the river, and higher water levels during the 2005 summer provided better boating conditions than in past years. From 2002-2004 the popular salmon fishery at Bird Creek was not readily available due to road construction, this created more of a demand for people to look at opportunities on the Twentymile River and they have continued to use the river in 2005. pack raft use continues to increase. A new trail could increase pack raft use dramatically this coming summer (2006). These 1-person vessels are extremely small, hard to see, and have very different maneuvering ability than a power boat. Because there's not much room for gear in a pack raft, and the hike over the pass to the put-in takes at least 8 hrs, the majority of this use would is anticipated to be in the evening during the long summer days.

Management Direction:
Management direction from the revised Forest Plan is both forest-wide, and management area direction.

Forest-wide direction that applies directly to this capacity study is the Recreation and Tourism Standards and Guidelines. Standard no. 2 states that "Management activities will be designed to meet the ROS class as mapped." Guideline no. 1 states "Management activities should ensure that levels of use are consistent with the ROS Class characteristics…"

The following table describes the ROS Class Characteristics for the mapped ROS class in the Twentymile River, (Semi-Primitive Nonmotorized (SPNM)) as well as for the way the River is actually being used (Semi-Primitive Motorized (SPM)). It is excerpted from the Revised Forest Plan, page 3-38.

ROS class	Solitude on trails & shorelines	Level of encounters		Maximum party size
		On Trails	On Shorelines	
SPNM	High-moderate	<15 parties/day	<6 parties/day	24
SPM	moderate			30

The mapped ROS is SPNM, but the river corridor is regularly traveled by motorized boats, so the River itself is actually being managed as SPM. There is less expectation for solitude in the SPM class, otherwise the social characteristics are the same as SPNM. The SPNM class was applied to this area to describe the vast majority of the Twentymile Valley, as well as the type of use to expect immediately adjacent to the river (such as: No ATV's, hover craft or other motorized over-land vehicles allowed).

The Levels of Encounters "On Trails" is the characteristic used for this capacity analysis. The River acts like a trail, and although its use is predominantly motorized, the levels of encounters characteristic does not vary between the SPNM and SPM ROS classes.

Management Area direction for the Twentymile River. The prescription for the valley-floor area is #231 – Scenic River Management Area, found on pages 4-46 thru 4-50 of the Forest Plan. Direction that applies to the recreation capacity is found in the Management Intent, Social Systems Desired Condition section:

"provide good opportunities for solitude, isolation and quiet when traveling on the river"

"Tourism related activities may involve various group sizes with limited facilities."

Also, in the Activities Table for this management area, *50% of the capacity is allocated to Outfitter guide use.*

Issues and Concerns:
Contacts were made with all existing and any known potential Outfitter Guides, Alaska Dept. of Fish and Game, US Coast Guard, other river managers, and Wild and Scenic River specialists, fisheries biologists and permit administrators with the Forest Service to understand concerns about operating on the river and capacity issues.

One concern is that there has been no documentation of the current recreational use on the river. The amount, timing, and type of use is known only through general observations by Forest Service personnel over the past decade.

Issues and concerns raised by these contacts include:

- **Safety:** The most voiced safety concern is about operations on the upper sections of river. There are many blind corners and power boats need to operate at high velocity to maintain navigability on the upper river. Blind corners and high speeds create potential for collisions, especially between motorized boats heading upstream and non-motorized rafts floating downstream. The river provides many

obstacles, some not readily apparent, and the conditions can change with each storm event. Communications are limited to satellite phones or VHF. Other safety concerns are listed in the next two bullets.

- **Types/size of Boats:** conflicts between various types of users; airboats create higher noise levels and can go places traditionally not accessible to power boats; larger and higher-powered jet boats displace more water, potentially swamping smaller boats and also access areas traditionally not used by power boats; increase in use by small pack-rafts that can be difficult to see and have very different maneuverability than power-boats.
- **Parking:** The existing boat launch area is approximately 200' long and 40' deep, immediately adjacent to a 55 MPH, 2-lane section of the Seward Highway. There is no turn lane, but a straight alignment of the highway does provide good sight distances. The high volumes of summer traffic can create safety concerns when entering or leaving the parking/launch area. People in the parking lot are fairly exposed to the highway traffic since there is no physical separation between the parking area and highway. There is room for up to 12 vehicles with trailers to park without blocking access to the launch. Additional parking was previously available directly across the highway from launch area, but it is on Alaska Railroad property and has been closed to public use. The Alaska Railroad has a large parking area approximately ¼ mile south of the launch area that can potentially be used, requiring a walk back to the launch site on the highway shoulder (there is no pedestrian pathway), and crossing the highway. There is no toilet at the launch parking, human wastes are beginning to be a concern.
- **Scenic and Recreational Values:** Allowing significant increase in use, size and power of boats could detract from the river's wildland character.
- **Erosion:** not a big concern at this time, natural forces cause significantly more erosion than boat wakes or foot traffic.
- **Fisheries:** Concern about affects of large horsepower jet engines on salmon eggs and on spawning salmon in shallow water areas located area above fishing closure. The river's fishery are wild runs, monitored by State Fish & Game using aerial surveys each fall, they have no over-fishing concerns at this time.

Capacity Alternatives:

Based on information presented in this report, the factors determined to be the most relevant in determining capacity are:

- safety
- detrimental effects to salmon reproduction
- number of encounters
- capacity allocated to O/G's

Safety concerns can be addressed in permit stipulations, such as limiting use on the upper river, limiting boat size, type and horsepower, and requiring communications between power boat O/G's and float trip O/G's so each knows when they may encounter each other on the upper Glacier River (above the Glacier River fishing closure).

The effects to salmon reproduction stem from concerns about larger engines in shallow water; limiting boat size, type and horsepower could address these concerns as well as the safety concerns.

The effects to safety and salmon need to be monitored in order to reach verifiable conclusions. Until monitoring occurs, it is recommended that there be no regulations on boat size, type or horsepower.

The Forest Plan has set the numbers of encounters at <15 parties/day on trails for this area, and has allocated ½ of the total capacity for Outfitter Guides. These limits were applied in several different ways, until a method that provided the maximum amount of use for O/G's without infringing upon the non-guided users was found. The following describes the ways the encounters characteristic and total capacity allocation evolved to the recommended capacity allocation.

1. Each boat trip on the river is a party, and each party creates an encounter when they go upstream and pass another party on the river, and another encounter when they return and pass this same party, so in essence, each O/G party creates 2 encounters for another party on the river. If the total encounters needs to remain below 15, and half of the capacity is for O/G use, then up to 7 encounters can be generated by O/G's. If each O/G party creates 2 encounters, there can be 3 O/G parties/day. This limit seemed very restrictive, so the next step was taken

2. Because people using the river can move, or can position themselves in a slough where they are not subject to an encounter, the average number of encounters generated by each O/G party is more realistically 1. So, there could be 7 O/G parties/day. This limit also seemed very restrictive, so the next step was taken

3. The highest concentration of non-guided use occurs during the salmon runs from mid July to early September. A large portion of the O/G use is sightseeing and can occur outside of the salmon fishing season. So, the idea to manage O/G use so that more of it occurs before and after the salmon runs, and less during the salmon runs was tried. This keeps the overall use for O/G's at ½ of the total capacity for the summer season, but not on a daily basis. Before and after the salmon runs, there would be more use by O/G's, and less by non-guided parties, and conversely, during the salmon runs, O/G use would be restricted and non-guided parties would account for more than ½ of the use.

4. These "sub-seasons" of the summer use season were further divided into weekends/holidays and weekdays, resulting in 4 distinct sub-seasons:
    1) Non-peak weekdays (May 11 – July 10 & Sept. 1 – Oct. 10)
    2) Non peak weekends & holidays (May 11 – July 10 & Sept. 1 – Oct. 10)
    3) Peak weekdays (July 11 – Aug. 31)
    4) Peak weekends (July 11 – Aug. 31)

5) In order to allow even more O/G use while remaining within the encounters characteristic, the idea to regulate guided parties by creating specific time periods for parties to be on the river was considered. Since more use was going to be allocated to O/G's before and after the salmon runs (the "non-peak season"), 3 time periods were established so that even though there was more use, it would be more uniformly distributed throughout the day.

6) Investigating further, the O/G limits were set up based on multiples of 7, because if 7 O/G parties passed by another party at least once, there would be 7 encounters, which as described in no. 2 above, would be the total amount each O'G party, on average, is expected to create. This worked well for the non-peak season weekday, when there is expected to be little or no non-guided use on the river, and the amount of O/G parties would be maximized. As we looked at the numbers and saw the encounters generated with multiples of 7, a new strategy evolved as described next.

7) The O/G limits were modified by using multiples of 4, because that's the number of O/G companies that are expected to be using power boats on the river this summer.

8) Using multiples of 4 provides numbers that can be readily used for allocation to the 4 power boat O/G's, and it allowed an analysis of the amount of use that would be available to non-guided users, while staying within the ROS encounters class characteristic.

9) Scenarios were analyzed that maximized the amount of non-guided parties based on different guide limits. A report is available upon request at the district office that fully describes all the scenarios looked. The amount of non-guided use that resulted in reaching the maximum of 14 encounters in combination with the various levels of O/G limits are shown on the spreadsheets in the report.

Capacity Recommendations:
Based on the alternatives described above, the four categories and allocation of use recommended are:

Season	dates	Total no. days	% of season	Total O/G parties/day	No. of time periods
Non-peak weekdays	May 11 – July 10;	69	45%	21	3
Non-peak weekends*	Sept 1 – Oct 10	33	21%	12	3
Peak weekdays	July 11 – Aug 31	38	25%	8	2
Peak weekends		14	9%	4	1
	TOTAL	154	100%		

*weekends include Memorial Day, Independence Day and Labor Day holidays

Recommendations include that O/G use be further limited by establishing a maximum of 7 parties/time period for the 21 parties/day guide limit, and 4 parties for each time period in the 12 parties/day and the 8 parties/day limits.

The three time periods recommended are 7am-11am, 11am-3pm, 3pm-7pm. When there are just two time periods/day, the recommended time periods are 7am-1pm, and 1pm - 7pm.

To address safety concerns, it is recommended that permit stipulations close the upper stretches of the Twentymile River (above the Twentymile/Glacier River Fork) to power-boat sightseeing trips, and no use by fishing O/G would be permitted above the fishing closure on the Twentymile branch (approx. river mile 10). This is in direct response to the increased number of pack rafters expected to be using the Twentymile fork of the river. The upper stretches of river have the most safety concerns (blind corners, faster water, and limited maneuverability). Bulletin boards will be installed at the Twentymile boat launch and at two trailheads where pack-rafters begin their hike, informing the pack-rafters about the power boat use on the river, and the need to be visible on the river, and letting power boaters know that pack-raters may be encountered on the river. Additional permit stipulations would require that permittees providing float trips from Carmen or Twentymile Lakes call the power boat permitees that may be on the upper stretches of the Glacier River to inform them when their float trip would be using this part of the river.

Conclusions:
Using this allocation, the encounters characteristic for the SPNM ROS class should be met most of the time. The exceptions would be when non-guided parties are on the river all day during the non-peak time periods, or when there are more non-guided parties on the river than O/G parties.

The Forest Plan's Management Area direction calling for opportunities for solitude, isolation and quiet when traveling on the river may be hard to accomplish on the lower stretches of the river during the peak fishing season without establishing some method to limit non-guided users.

Further Study:
It is recommended that this allocation system be monitored by the Forest Service during the 2006 summer and adjustments made based on findings. Recommended monitoring includes studies to determine the effects of the larger horsepower engines and larger-displacement boats to salmon eggs and spawning salmon in the upper river, and gathering data on amount, type and distribution of parties using the river, especially non-guided parties.

Results from this monitoring will help make more informed decisions about future management options for this river.